



Dart Hawkesbury  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada

Tel (613) 632-5200

5002654

D206-642-341BL  
Job Sheet 166596



Part No: D206-642-341BL

Job Qty: 1 ea

Part Name: Replacement Skidtube (Fits LH or RH)

CHG005 ✓



Part Weight: 0 lbs

Status: Scheduled

Priority: Medium

Job Created: 10/12/17

Job Tracking No:

Due Date: 10/27/17

Created By: Mario Poulin

Type: Stock

Description:

Note: DWG REV F(DEO) IPP Rev: H 05.10.11 Added D3429-1 per CHG004 KJ/CP/JLM IPP Rev: I 08-09-29 revF as per dwg DD verified by: EC Est Rev: J 09-03-02 as per DSI9440 rev. a DD verified by: EC IPP rev K 10.08.03 ch ms27039-1-08 for "C" type EC ver: DD IPP Rev: L 12.11.22 now swage per ecn12-679 DD ver: JLM IPP Rev: M 14.04.25 ECN14-520 DD ver: JLM IPP REV: N 15.10.09 ADDED BL DD VERF: JLM IPP REV: O 16.01.22 PAR16-484 DD VERF: JLM

Ship Via:

### Bill of Materials

### Job Routing

| Op No | Operation          | Qty   | Due Date | Standard  |         | Workcenter/Supplier   |              |
|-------|--------------------|-------|----------|-----------|---------|-----------------------|--------------|
|       |                    |       |          | Setup hrs | Run Hrs | Workcenter / Supplier | Lead Time    |
| 90    | Start up Operation | 1 Ea  | 10/26/17 | 0.00      | 0.00    | Start up container    |              |
| 100   | DC                 | 1 pcs | 10/26/17 | 0.00      | 0.00    | DC                    |              |
| 110   | Skidtubes          | 1 pcs | 10/26/17 | 0.00      | 1.58    | Skidtubes             |              |
| 115   | QC                 | 1 pcs | 10/26/17 | 0.00      | 0.00    | QC5                   |              |
| 116   | QC                 | 1 pcs | 10/26/17 | 0.00      | 0.00    | QC9                   |              |
| 120   | HandFinish         | 1 pcs | 10/26/17 | 0.00      | 1.17    | HandFinish1           |              |
| 125   | QC                 | 1 pcs | 10/26/17 | 0.00      | 0.00    | QC7                   |              |
| 130   | Skidtubes          | 1 pcs | 10/26/17 | 0.00      | 1.58    | Skidtubes             |              |
| 140   | QC                 | 1 pcs | 10/26/17 | 0.00      | 0.00    | QC5                   |              |
| 150   | Skidtubes          | 1 pcs | 10/26/17 | 0.00      | 1.58    | Skidtubes             |              |
| 180   | QC                 | 1 pcs | 10/26/17 | 0.00      | 0.00    | QC5                   |              |
| 190   | HandFinish         | 1 pcs | 10/26/17 | 0.00      | 1.17    | HandFinish2           |              |
| 200   | Purchasing         | 1 pcs | 10/26/17 | 0.00      | 0.00    | Purchasing            | DAS          |
| 205   | QC                 | 1 pcs | 10/26/17 | 0.00      | 0.00    | QC6                   | 38 DAS       |
| 210   | QC                 | 1 pcs | 10/26/17 | 0.00      | 0.00    | QC14                  | 9-89 38      |
| 220   | HandFinish         | 1 pcs | 10/27/17 | 0.00      | 1.17    | HandFinish4           | 8EB 9-89 DAS |
| 230   | QC                 | 1 pcs | 10/27/17 | 0.00      | 0.00    | QC3                   | DAS 38       |
| 240   | QC                 | 1 pcs | 10/27/17 | 0.00      | 0.00    | QC5                   | 38 9-89      |
| 250   | Packaging          | 1 pcs | 10/27/17 | 0.00      | 0.00    | Packaging3            | 9-89         |
| 260   | QC21-FG            | 1 Ea  | 10/27/17 | 0.00      | 0.00    | QC21                  |              |

Part Op 100 - Photocopy bluefile and create labels per PPP D206-642-341 CHG005 ✓

Descriptions: 110 - 1-Deburr Fwd edge of tube 2-Scribe "Identify Batch Number" 3-Remove ridge on inside of Fwd edge of tube as per Dwg D2650 4-Weld Fwd Cap as per Dwg D2650. Use aluminum rod. Grind D2647 to fit as required. A/R Aluminum Rod 5-Grind weld flush to cap on top surface only. 6-Cut aft end to length as per dwg D2650 7-Drill pilot holes using drill Jig DT8168A (A & B) and DT8025. 8-Drill holes for wearplates using DT 8028-5. Open to Ø 0.297". 9-Open Aft Cap Hole using #6 Drill Bit 10-Open holes for Tow Ring to Ø 0.625" as per Dwg D2650, D2650-5 Drilling Detail 11-Remove inner indexing ridge on aft end of skidtube as per Dwg D2650 12- Ream holes to finished size as per Dwg D2650, D2650-5 Drilling Detail (without cutting fluid) 13-Deburr.

130 - 1- Bond D2654-5 web in place as per QSI 015 Ensure holes line up Allow 12 Hrs. cure time before cutting Start

Date: 2017/10/20 Time: 10:35 Finish Date: 11-00 Time: 11-00 A/R Sikaflex-291 138535

Sikaflex expiry date: 2018-04-21

150 - 1- Insert D4720-1 Spacer. Swage to 0.313" X 0.75" DP per QSI 002. Trim and grind flush per QSI 002



DQA: \_\_\_\_\_ Date: \_\_\_\_\_

## WORK ORDER NON-CONFORMANCE / UPDATE



Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |                                                                                                                                                                                    |                                                                                                                                                          |                                                                                                                                                       |                                                                                                                                                                       |                                                                                                            |
|--------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suggested Unapproved <input type="checkbox"/> | <b>AGAINST DEPARTMENT/PROCESS</b>                                                                                                                        |                                                                                                                                                       |                                                                                                                                                                       |                                                                                                            |
|                                                              |                                                                                                                                                                                    | Skid-tube <input type="checkbox"/><br>Machining <input type="checkbox"/><br>Thermoforming <input type="checkbox"/><br>Large Fab <input type="checkbox"/> | Cross tube <input type="checkbox"/><br>Small Fab <input type="checkbox"/><br>Finishing <input type="checkbox"/><br>Composite <input type="checkbox"/> | Water Jet <input type="checkbox"/><br>Prod. Eng. Coord. <input type="checkbox"/><br>Rec/Store/Packaging <input type="checkbox"/><br>Supplier <input type="checkbox"/> | Engineering <input type="checkbox"/><br>Quality <input type="checkbox"/><br>Other <input type="checkbox"/> |

Date : \_\_\_\_\_  
  
 Desc: \_\_\_\_\_

**Job No: 166596**  
**Mfg Date: 10/19/17**

**Change No:**  
**Quantity:**  
**Operation:**  
**Revision:**  
**PART NO:** D206-642-341BL  
**Start up Operation**

**Replacement Skidtube (Fits LH or RH)**  


**S001080**  
**DART AEROSPACE**

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 Hawkesbury, ON K64 1K7  
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 Email: sales@dartaero.com  
 www.dartaerospace.com

**MRB (QSI042) Approval**  
  
**Completed By**  
  
**Lead hand / Supervisor Approval Verification**  
  
**QC / QA Coordinator Approval**

|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Root Cause</b><br>Environment <input type="checkbox"/><br>Design <input type="checkbox"/><br>Doc/Data <input type="checkbox"/><br>Equip/Tooling <input type="checkbox"/><br>Handling/Pre <input type="checkbox"/><br>Material <input type="checkbox"/><br>Internal Transport <input type="checkbox"/><br>Tribal Knowledge <input type="checkbox"/><br>LOA <input type="checkbox"/><br>Substation <input type="checkbox"/><br>Past Expiry Date <input type="checkbox"/><br>Misidentified <input type="checkbox"/> | No <input type="checkbox"/><br>Op <input type="checkbox"/><br>Of <input type="checkbox"/><br>Supplier <input type="checkbox"/><br>Training <input type="checkbox"/><br>Use for Testing <input type="checkbox"/><br>Poor Information <input type="checkbox"/><br>Rushing <input type="checkbox"/><br>Product Improvement <input type="checkbox"/><br>Process Improvement <input type="checkbox"/><br>Manufacturing Process <input type="checkbox"/><br>Past Due <input type="checkbox"/> | Cracks <input type="checkbox"/><br>Crimp/Kink/Ripple/Wave <input type="checkbox"/><br>Cuffs <input type="checkbox"/><br>Crushing <input type="checkbox"/><br>Heat Treat <input type="checkbox"/><br>Wave/Twist in Tube <input type="checkbox"/><br>Marks/Chatter <input type="checkbox"/> | Broken/Damage/Defect <input type="checkbox"/><br>Inspection Incomplete/Unqualified <input type="checkbox"/><br>Contamination <input type="checkbox"/><br>Countersink <input type="checkbox"/><br>Cut Too Short <input type="checkbox"/><br>Instructions Incomplete/Unclear <input type="checkbox"/><br>Drill Holes <input type="checkbox"/> | Weld <input type="checkbox"/><br>Wrong Stock Pulled <input type="checkbox"/><br>Out of Sequence <input type="checkbox"/><br>Off-set <input type="checkbox"/><br>Mislabelled <input type="checkbox"/><br>Fit/Function <input type="checkbox"/><br>Misaligned/off center <input type="checkbox"/> | Positioned Wrong <input type="checkbox"/><br>Outside Dimensions <input type="checkbox"/><br>Over/Under tolerance <input type="checkbox"/><br>Part Incorrect <input type="checkbox"/><br>Part Lost/Missing <input type="checkbox"/><br>Part Moved <input type="checkbox"/><br>Drawing <input type="checkbox"/><br>Finish <input type="checkbox"/><br>Misread <input type="checkbox"/><br>Turning Sequence <input type="checkbox"/> |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

er Loss/Surge /Program ☐

OTHER : \_\_\_\_\_

200 - ISSUE PO 38152 \*\*\*MASK ALL SADDLE AND GROUND HANDLING ATTACHMENT HOLES AS PER PAR16-484\*\*\* Make sure Nut Plate Thread is protected using paint screw, and mask GHW studs. PRIME: Start Time: \_\_\_\_\_ Finish Time: \_\_\_\_\_ PAINT: DELFLEET BLUE \_\_\_\_\_ Start Time: \_\_\_\_\_ Finish Time: \_\_\_\_\_ CLEAR DELFLEET B \_\_\_\_\_

13  
OCT 26 2017

220 - 1-Install inserts & wearpads as per dwg D2922. Use a drop of Sikaflex inside insert holes before installing wearpad/wearplate. A/R Sikaflex-291 M137526 Sikaflex expiry date: 17/11 2-Install O-Rings D2651-3 on plugs D2651-1 with Petroleum Jelly and install plugs as per Dwg D2650. Clean excess adhesive 3-Install MS27039-4-06 Screw 4-Inspect for foreign object per QSI 024 5-Install D2646 Aft Cap and seal with SikaflexClean excess adhesive A/R Sikaflex-291 M137526 Sikaflex expiry date: 17/11 6- Install D2680-041 Nut Plate as per Dwg D2650 7-Wing Walk as per Dwg D2650-5 and QSI 005 4.4 Batch: M138373

250 - Identify and pack for shipping as per PPP D206-642-341 Location:FG083

RTU 598 M138424 EXP 18/05

### Job Allocations

| Operation             | Component Part         | Required | Inventory | Allocated | Std Qty |
|-----------------------|------------------------|----------|-----------|-----------|---------|
| 90-Start up Operation | D2620 <u>B164474</u>   | 1        | 30        | 0         | 0       |
|                       | D2647 <u>B163996</u>   | 1        | 41        | 0         | 0       |
|                       | D2654-5 <u>B164376</u> | 1        | 3         | 0         | 0       |
| 150-Skidtubes         | D4720-1 <u>B161569</u> | 19       | 590       | 0         | 0       |
| 220-HandFinish        | ALS4-1032-130 ✓        | 54       | 120       | 0         | 0       |
|                       | CCR264SS3-3 ✓          | 2        | 298       | 0         | 0       |
|                       | CR3212-4-03 ✓          | 2        | 249       | 0         | 0       |
|                       | D2646BL ✓              | 1        | 14        | 0         | 0       |
|                       | D2651-1BL ✓            | 14       | 521       | 0         | 0       |
|                       | D2651-3 ✓              | 14       | 544       | 0         | 0       |
|                       | D2680-041 ✓            | 1        | 77        | 0         | 0       |
|                       | D3537-1 ✓              | 6        | 107       | 0         | 0       |
|                       | D3537-3 ✓              | 1        | 19        | 0         | 0       |
|                       | D4956-11 ✓             | 1        | 20        | 0         | 0       |
|                       | D4956-23 ✓             | 1        | 15        | 0         | 0       |
|                       | D4956-35 ✓             | 1        | 19        | 0         | 0       |
|                       | MS27039-1-08 ✓         | 2        | 215       | 0         | 0       |
|                       | MS27039-4-06 ✓         | 1        | 88        | 0         | 0       |
|                       | MS27039C1-08 ✓         | 54       | 171       | 0         | 0       |
|                       | NAS1149C0332R ✓        | 54       | 2,674     | 0         | 0       |
|                       | NAS1149D0332J ✓        | 2        | 1,532     | 0         | 0       |
|                       | NAS1149D0463J ✓        | 1        | 1,118     | 0         | 0       |

### Part Specifications

Specifications could not be found.

Plex 10/12/17 10:09 AM dart.poulin.mario



DQA: \_\_\_\_\_ Date: \_\_\_\_\_



## WORK ORDER NON-CONFORMANCE / UPDATE

QA Closed: \_\_\_\_\_ Date: \_\_\_\_\_

Work Order update only ☐

|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               |  |                       |                                                 |  |
|--------------------------------------------------------------|------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|--|-----------------------|-------------------------------------------------|--|
| Work Order: _____<br><br>Part No. _____<br><br>NCR No. _____ |                                                | <b>DISPOSITION</b><br><br>Rework <input type="checkbox"/><br>Scrap <input type="checkbox"/><br>Use-as-is <input type="checkbox"/><br>Suspected Unapproved <input type="checkbox"/> |                                                            | <b>AGAINST DEPARTMENT/PROCESS</b><br><br><div style="display: flex; justify-content: space-between;"> <div>           Skid-tube <input type="checkbox"/><br/>           Machining <input type="checkbox"/><br/>           Thermoforming <input type="checkbox"/><br/>           Large Fab <input type="checkbox"/> </div> <div>           Cross tube <input type="checkbox"/><br/>           Small Fab <input type="checkbox"/><br/>           Finishing <input type="checkbox"/><br/>           Composite <input type="checkbox"/> </div> <div>           Water Jet <input type="checkbox"/><br/>           Prod. Eng. Coord. <input type="checkbox"/><br/>           Rec/Store/Packaging <input type="checkbox"/><br/>           Supplier <input type="checkbox"/> </div> <div>           Engineering <input type="checkbox"/><br/>           Quality <input type="checkbox"/><br/>           Other <input type="checkbox"/> </div> </div> |                                               |  |                       |                                                 |  |
| Date :                                                       |                                                | Step #:                                                                                                                                                                            |                                                            | QTY Effective :                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               |  | MRB (QS1042) Approval |                                                 |  |
| Description Work Order Deviation                             |                                                |                                                                                                                                                                                    |                                                            | Disposition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                               |  |                       | Completed By                                    |  |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               |  |                       | Lead hand / Supervisor<br>Approval Verification |  |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               |  |                       | QC / QA Coordinator<br>Approval                 |  |
|                                                              |                                                |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               |  |                       |                                                 |  |
| <b>Root Cause</b>                                            |                                                | <b>FAULT CATEGORY</b>                                                                                                                                                              |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               |  |                       |                                                 |  |
| Environment <input type="checkbox"/>                         | No Re-verification <input type="checkbox"/>    | Pressure/Forced <input type="checkbox"/>                                                                                                                                           | Temperature/Cure <input type="checkbox"/>                  | Power Loss/Surge <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Positioned Wrong <input type="checkbox"/>     |  |                       |                                                 |  |
| Design <input type="checkbox"/>                              | Operator <input type="checkbox"/>              | Bending <input type="checkbox"/>                                                                                                                                                   | Set-up <input type="checkbox"/>                            | Folio/Program <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Outside Dimensions <input type="checkbox"/>   |  |                       |                                                 |  |
| Doc/Data <input type="checkbox"/>                            | Offset/Setup <input type="checkbox"/>          | Centre Not Concentric <input type="checkbox"/>                                                                                                                                     | BOM/Route <input type="checkbox"/>                         | Grain <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Over/Under tolerance <input type="checkbox"/> |  |                       |                                                 |  |
| Equip/Tooling <input type="checkbox"/>                       | Supplier <input type="checkbox"/>              | Cracks <input type="checkbox"/>                                                                                                                                                    | Broken/Damage/Defect <input type="checkbox"/>              | Weld <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Part Incorrect <input type="checkbox"/>       |  |                       |                                                 |  |
| Handling/Pre <input type="checkbox"/>                        | Training <input type="checkbox"/>              | Crimp/Kink/Ripple/Wave <input type="checkbox"/>                                                                                                                                    | Inspection Incomplete/Unqualified <input type="checkbox"/> | Wrong Stock Pulled <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Part Lost/Missing <input type="checkbox"/>    |  |                       |                                                 |  |
| Material <input type="checkbox"/>                            | Use for Testing <input type="checkbox"/>       | Cuffs <input type="checkbox"/>                                                                                                                                                     | Contamination <input type="checkbox"/>                     | Out of Sequence <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Part Moved <input type="checkbox"/>           |  |                       |                                                 |  |
| Internal Transport <input type="checkbox"/>                  | Poor Information <input type="checkbox"/>      | Crushing <input type="checkbox"/>                                                                                                                                                  | Countersink <input type="checkbox"/>                       | Off-set <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Drawing <input type="checkbox"/>              |  |                       |                                                 |  |
| Tribal Knowledge <input type="checkbox"/>                    | Rushing <input type="checkbox"/>               | Heat Treat <input type="checkbox"/>                                                                                                                                                | Cut Too Short <input type="checkbox"/>                     | Mislabeled <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Finish <input type="checkbox"/>               |  |                       |                                                 |  |
| LOA <input type="checkbox"/>                                 | Product Improvement <input type="checkbox"/>   | Wave/Twist in Tube <input type="checkbox"/>                                                                                                                                        | Instructions Incomplete/Unclear <input type="checkbox"/>   | Fit/Function <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Misread <input type="checkbox"/>              |  |                       |                                                 |  |
| Substation <input type="checkbox"/>                          | Process Improvement <input type="checkbox"/>   | Marks/Chatter <input type="checkbox"/>                                                                                                                                             | Drill Holes <input type="checkbox"/>                       | Misaligned/off center <input type="checkbox"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Turning Sequence <input type="checkbox"/>     |  |                       |                                                 |  |
| Past Expiry Date <input type="checkbox"/>                    | Manufacturing Process <input type="checkbox"/> | OTHER : <input type="checkbox"/>                                                                                                                                                   |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               |  |                       |                                                 |  |
| Misidentified <input type="checkbox"/>                       | Past Due <input type="checkbox"/>              |                                                                                                                                                                                    |                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                               |  |                       |                                                 |  |

| QTY<br>-1 | QTY<br>-3 | QTY<br>-5 | QTY<br>-7 | PART NUMBER   | DESCRIPTION                                             |
|-----------|-----------|-----------|-----------|---------------|---------------------------------------------------------|
| X         |           |           |           | D2650-1       | SKIDTUBE ASSEMBLY                                       |
|           | X         |           |           | D2650-3       | SKIDTUBE ASSEMBLY                                       |
|           |           | X         |           | D2650-5       | SKIDTUBE ASSEMBLY                                       |
|           |           |           | X         | D2650-7       | SKIDTUBE ASSEMBLY                                       |
| 1         | 1         | 1         | 1         | D2600-1-160   | EXTRUSION                                               |
| 1         |           |           |           | D2654-1       | WEB                                                     |
|           | 1         |           |           | D2654-3       | WEB                                                     |
|           |           | 1         |           | D2654-5       | WEB                                                     |
|           |           |           | 1         | D2654-7       | WEB                                                     |
| 1         | 1         | 1         | 1         | D2646         | AFT CAP                                                 |
| 1         | 1         | 1         | 1         | D2647         | CAP                                                     |
| 17        | 18        | 19        | 23        | D2649         | CROSS BOLT SPACER                                       |
| 16        | 18        | 14        | 22        | D2651-1       | PLUG                                                    |
| 16        | 18        | 14        | 22        | D2651-3       | O-RING                                                  |
| 1         | 1         | 1         | 1         | D2680-041     | NUT PLATE                                               |
| 2         | 2         |           |           | D3286-1       | DOUBLER                                                 |
| 2         | 2         |           |           | D3286-3       | STUD                                                    |
| 42        | 44        | 54        | 60        | ALS7-1032-130 | INSERT (or AKS4-1032-130, ALS4-1032-130, ALS7-1032-130) |
| 2         | 2         | 2         | 2         | AN960JD10L    | WASHER                                                  |
| 2         | 2         | 2         | 2         | CCR264SS3-3   | RIVET                                                   |
| 2         | 2         | 2         | 2         | CR3212-4-03   | RIVET                                                   |
| 2         | 2         | 2         | 2         | MS27039-1-08  | SCREW                                                   |
| 1         | 1         | 1         | 1         | MS27039-4-06  | SCREW                                                   |
| 1         | 1         | 1         | 1         | AN960JD416    | WASHER                                                  |
| 52        | 52        |           |           | CR3212-4-04   | RIVET                                                   |

F

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 166596ND

OCT 12 2017

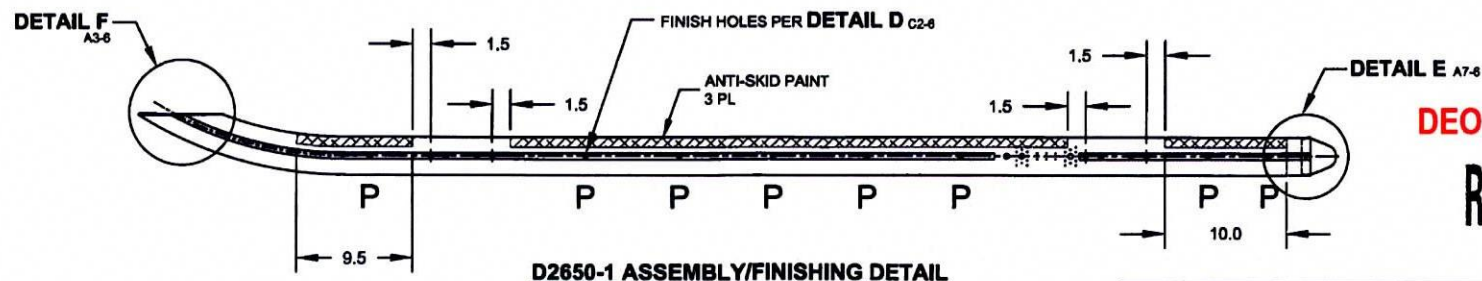
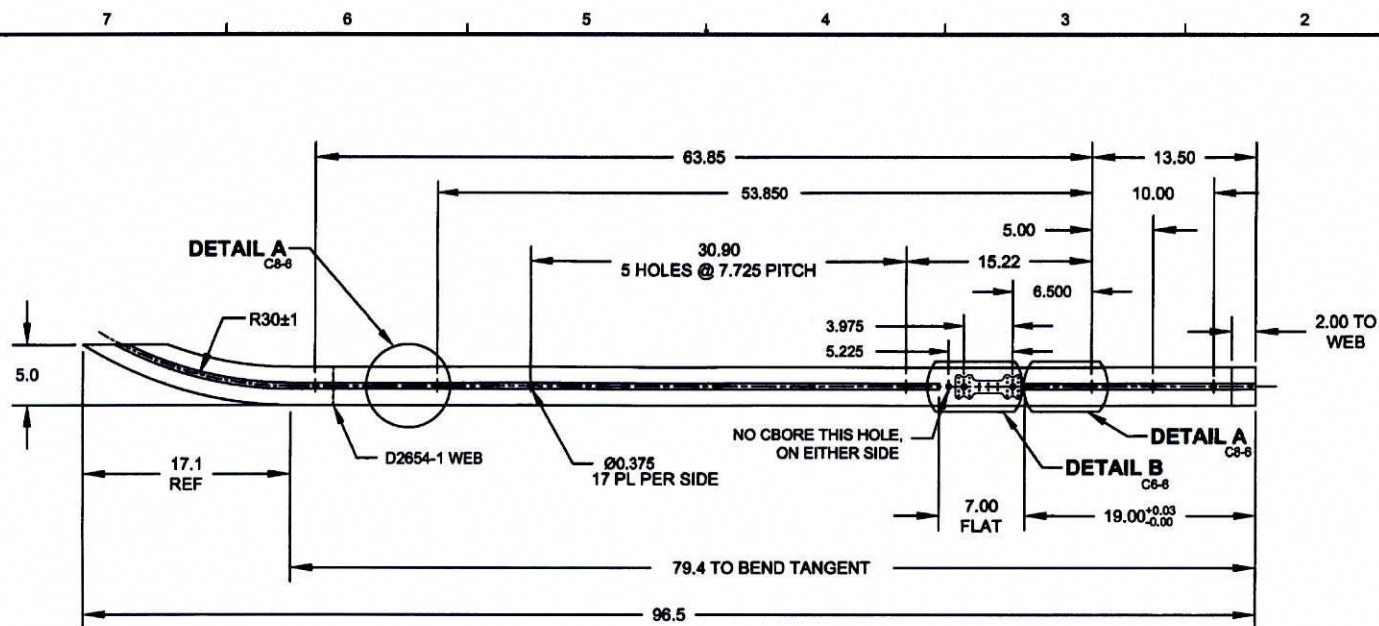
DEO ATTACHED

RELEASED  
08.07.23

**NOTES:**

- 1) MATERIAL: N/A
- 2) FINISH: -CHEMICAL CONVERSION COAT PER DART QSI 005 4.1  
-POWDER COAT WHITE (4.3.5.1) PER DART QSI 005 4.3  
-BLACK ANTI-SKID PAINT AS INDICATED TO 0.5 ABOVE LOCATION RIDGE PER DART QSI 005 4.4
- 3) TOLERANCES: PER DART QSI 018 UNLESS OTHERWISE NOTED
- 4) UNITS: INCHES UNLESS OTHERWISE NOTED
- 5) BREAK SHARP EDGES: 0.005 TO 0.010 MAX
- 6) IDENTIFICATION: NONE
- 7) WEIGHT: N/A
- 8) WELD PER DART QSI 004
- 9) DAMAGE TOLERANCE ON FWD BEND:  
THERE SHOULD BE NO VISIBLE WRINKLES IN THE BEND FROM THE GROUND TO A HEIGHT OF 5 INCHES ABOVE THE GROUND. IT IS ACCEPTABLE TO POLISH OUT GOUGES UP TO 0.020 DEEP IN THE BENT PORTION OF THE TUBE. A MAXIMUM REDUCTION IN DIAMETER OF 0.150" IS ACCEPTABLE IN THE BENT PORTION OF THE TUBE.
- 10) BOND WEB INTO OUTER TUBE WITH SIKAFLEX-241/-291 ADHESIVE PER DART QSI 015
- 11) INSERT D2651-1 PLUG C/W D2651-3 O-RING IN HOLES MARKED 'P' (BOTH SIDES OF TUBE)
- 12) DRILL Ø0.297 FOR ALS7-1032-130 INSERTS USING TEMPLATE DT8056-1 ON -1 TUBE, DT8056-5 ON -5 TUBE, AND DT8056-7 ON -7 TUBE. INSTALL INSERTS AFTER FINISH.
- 13) TOLERANCES ARE PER DART QSI 018 UNLESS OTHERWISE NOTED

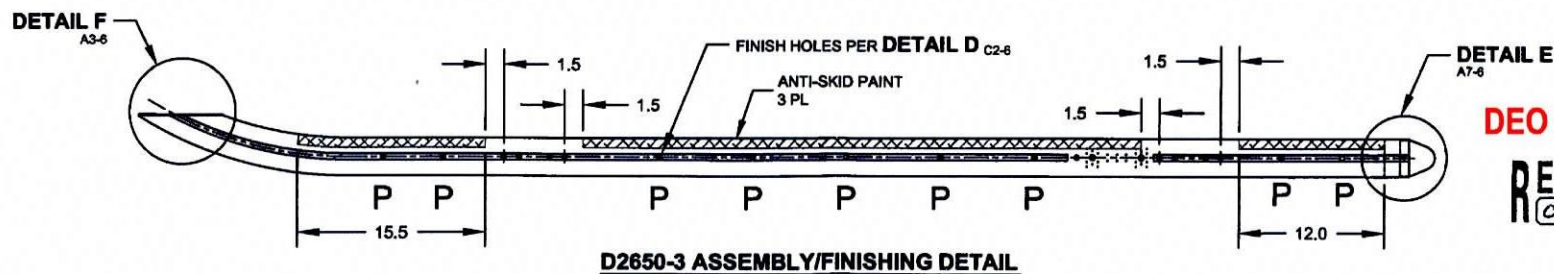
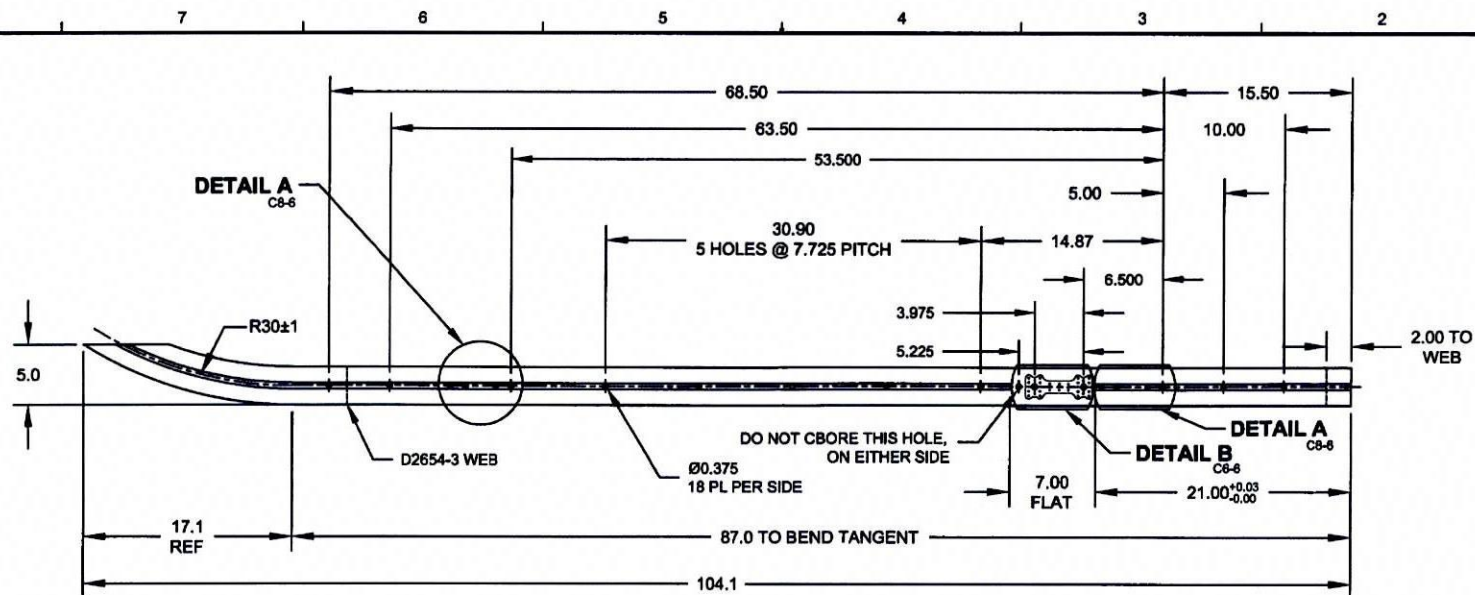
|            |                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                    |              |
|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| F          | DRAWING UPDATED TO CURRENT STANDARDS. SHT 6 ADDED. ALL SECTION AND DETAIL VIEWS TRANSFERRED TO SHT 6. SHT 1 IN PL PART D2649 QTY UPDATED. SHT 6 SECT C-C GRIND INSTRUCTIONS DELETED FROM NOTE 7 (SEE NCR 239). | AJS                                                                                                                                                                                                                                                                                | 08.08.08     |
| E          | REMOVE CBORE, CHG DRILL, ADD CHAMFER                                                                                                                                                                           | CP                                                                                                                                                                                                                                                                                 | 06.03.30     |
| D          | REDRAW; INCCRP. DE09136/9153/9163 MOD GROUND HANDLING ON D2650-1/-3                                                                                                                                            | CP                                                                                                                                                                                                                                                                                 | 04.05.17     |
| C          | CHANGE HOLE PATTERN AND FRONT END                                                                                                                                                                              | DS                                                                                                                                                                                                                                                                                 | 97.10.29     |
| B          | AS MANUFACTURED CHANGES                                                                                                                                                                                        | DS                                                                                                                                                                                                                                                                                 | 97.06.26     |
| A          | NEW ISSUE                                                                                                                                                                                                      | DS                                                                                                                                                                                                                                                                                 | 97.03.25     |
| REV.       | DESCRIPTION                                                                                                                                                                                                    | BY                                                                                                                                                                                                                                                                                 | DATE         |
| DESIGN     | DS                                                                                                                                                                                                             | <b>DART AEROSPACE USA, INC</b>                                                                                                                                                                                                                                                     |              |
| DRAWN      | AJS                                                                                                                                                                                                            | PORT HADLOCK, WA                                                                                                                                                                                                                                                                   |              |
| CHECKED    |                                                                                                                                                                                                                | DRAWING NO.                                                                                                                                                                                                                                                                        | REV. F       |
| MFG. APPR. |                                                                                                                                                                                                                | D2650                                                                                                                                                                                                                                                                              | SHEET 1 OF 6 |
| APPROVED   |                                                                                                                                                                                                                | TITLE                                                                                                                                                                                                                                                                              | SCALE        |
| DE APPR.   |                                                                                                                                                                                                                | 206/407 SKIDTUBE ASSEMBLIES                                                                                                                                                                                                                                                        | NTS          |
| DATE       | 08.08.08                                                                                                                                                                                                       | COPYRIGHT © 1997 BY DART AEROSPACE USA, INC<br>THIS DOCUMENT IS PRIVATE AND CONFIDENTIAL AND IS SUPPLIED ON THE EXPRESS CONDITION THAT IT IS NOT TO BE USED FOR ANY PURPOSE OR COPIED OR COMMUNICATED TO ANY OTHER PERSON WITHOUT WRITTEN PERMISSION FROM DART AEROSPACE USA, INC. |              |



**DEO ATTACHED**  
**RELEASED**  
880922/114

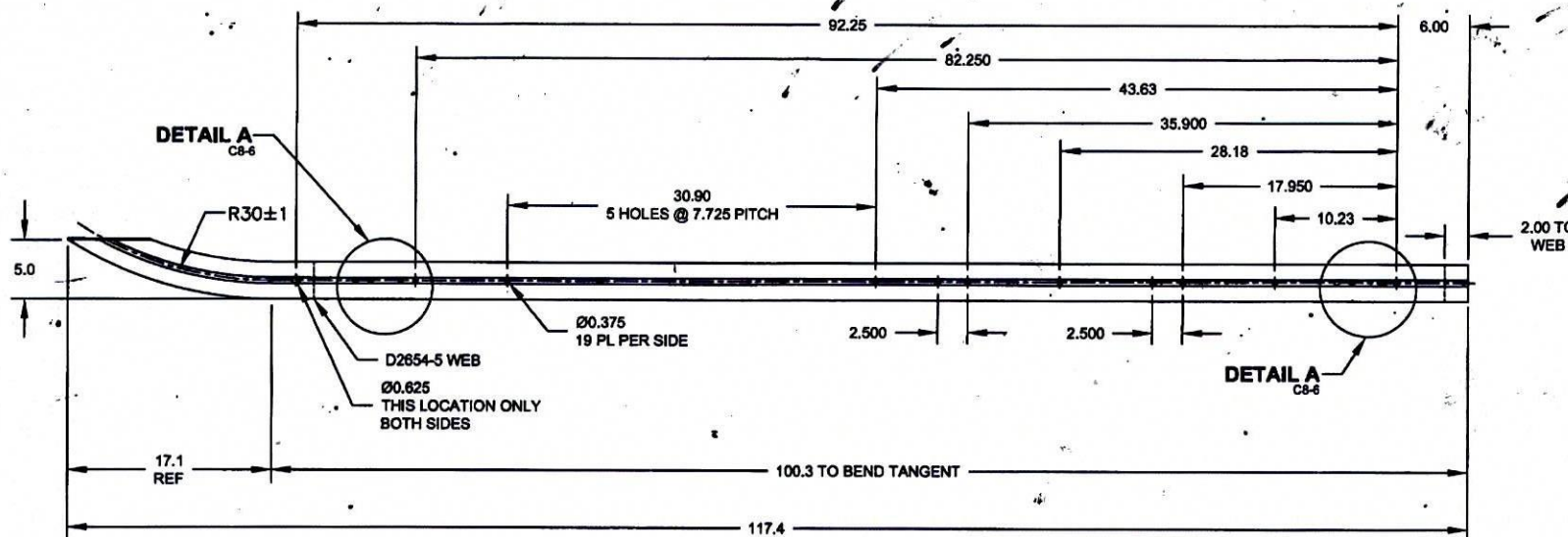
|            |          |                                                                                                                                                                                                                                                                                                    |              |
|------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE USA, INC</b>                                                                                                                                                                                                                                                                     |              |
| DRAWN      | AJS      | PORT HADLOCK, WA                                                                                                                                                                                                                                                                                   |              |
| CHECKED    |          | DRAWING NO.                                                                                                                                                                                                                                                                                        | REV. F       |
| MFG. APPR. |          | D2650                                                                                                                                                                                                                                                                                              | SHEET 2 OF 6 |
| APPROVED   |          | TITLE                                                                                                                                                                                                                                                                                              | SCALE        |
| DE APPR.   |          | 206/407 SKIDTUBE ASSEMBLIES                                                                                                                                                                                                                                                                        | NTS          |
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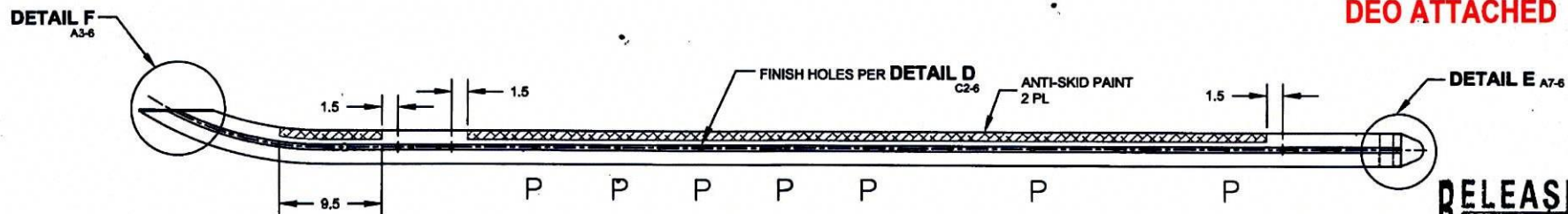


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RELEASED**  
05 07 22 1/18

|            |          |                                                                                                                                                                                                                                                                                                         |              |
|------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE USA, INC</b>                                                                                                                                                                                                                                                                          |              |
| DRAWN      | AJS      | PORT HADLOCK, WA                                                                                                                                                                                                                                                                                        |              |
| CHECKED    |          | DRAWING NO.                                                                                                                                                                                                                                                                                             | REV. F       |
| MFG. APPR. |          | D2650                                                                                                                                                                                                                                                                                                   | SHEET 3 OF 6 |
| APPROVED   |          | TITLE                                                                                                                                                                                                                                                                                                   | SCALE        |
| DE APPR.   |          | 206/407 SKIDTUBE ASSEMBLIES                                                                                                                                                                                                                                                                             | NTS          |
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**D2650-5 BENDING/DRILLING DETAIL**

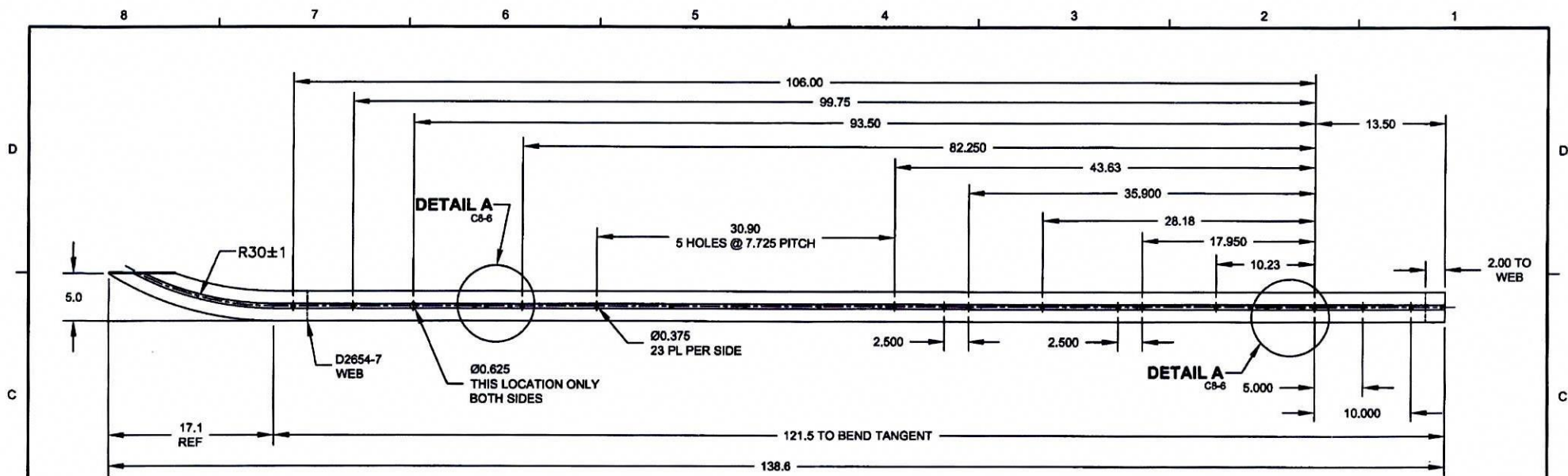


**D2650-5 ASSEMBLY/FINISHING DETAIL**

|            |          |                                                                                                                                                                                                                                                                                                    |              |
|------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE USA, INC</b>                                                                                                                                                                                                                                                                     |              |
| DRAWN      | AJS      | PORT HADLOCK, WA                                                                                                                                                                                                                                                                                   |              |
| CHECKED    |          | DRAWING NO.                                                                                                                                                                                                                                                                                        | REV. F       |
| MFG. APPR. |          | D2650                                                                                                                                                                                                                                                                                              | SHEET 4 OF 6 |
| APPROVED   |          | TITLE                                                                                                                                                                                                                                                                                              | SCALE        |
| DE APPR.   |          | 206/407 SKIDTUBE ASSEMBLIES                                                                                                                                                                                                                                                                        | NTS          |
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**RELEASED**  
08.09.22/11P

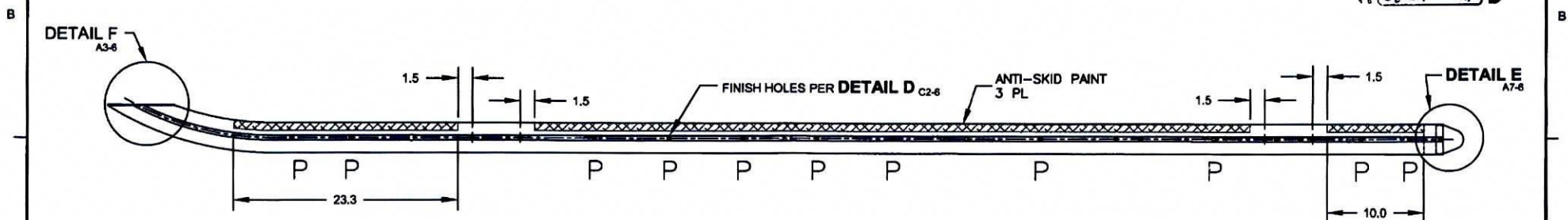




**D2650-7 BENDING/DRILL DETAIL**

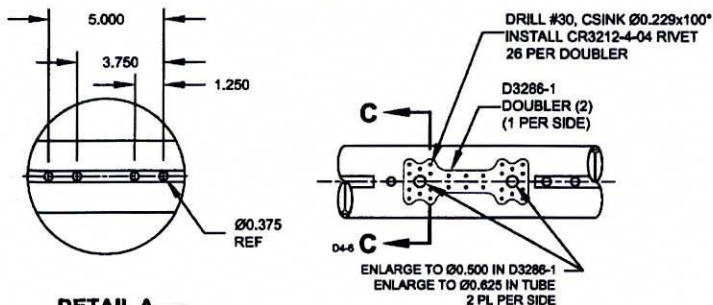
**DEO ATTACHED**

**RELEASED**  
08 07-22 111

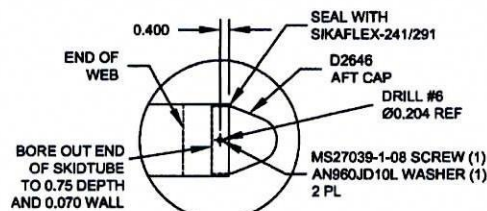
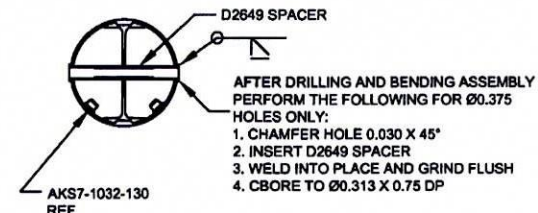
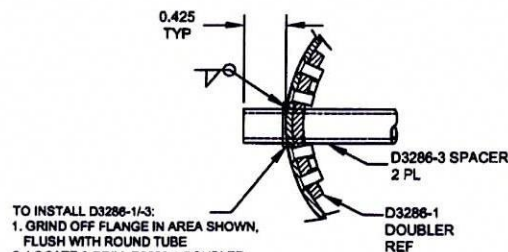


**D2650-7 ASSEMBLY/FINISHING DETAIL**

|            |          |                                                                                                                                                                                                                                                                                                    |              |
|------------|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE USA, INC</b>                                                                                                                                                                                                                                                                     |              |
| DRAWN      | AJS      | PORT HADLOCK, WA                                                                                                                                                                                                                                                                                   |              |
| CHECKED    |          | DRAWING NO.                                                                                                                                                                                                                                                                                        | REV. F       |
| MFG. APPR. |          | D2650                                                                                                                                                                                                                                                                                              | SHEET 5 OF 6 |
| APPROVED   |          | TITLE                                                                                                                                                                                                                                                                                              | SCALE        |
| DE APPR.   |          | 206/407 SKIDTUBE ASSEMBLIES                                                                                                                                                                                                                                                                        | NTS          |
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# **SECTION C-C** C7-6 SCALE NONE



- DETAIL F NOTES:**
1. CUT TUBE LEVEL
  2. REMOVE RIDGE ON FWD SIDE
  3. LOCATE D2647 (TRIM AS NECESSARY)
  4. WELD D2647 IN PLACE PER DART QSI 004
  5. GRIND FLUSH
  6. RIVET D2680-041 NUT PLATE IN PLACE
- NOTE: MASK THREADS IN D2680-041 PRIOR  
TO FINISH

**RELEASED**

**DEO ATTACHED**

|            |          |                                                                                                                                                                                                                                                                                             |              |
|------------|----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
| DESIGN     | DS       | <b>DART AEROSPACE USA, INC</b>                                                                                                                                                                                                                                                              |              |
| DRAWN      | AJS      | PORT HADLOCK, WA                                                                                                                                                                                                                                                                            |              |
| CHECKED    |          | DRAWING NO.                                                                                                                                                                                                                                                                                 | REV. F       |
| MFG. APPR. |          | D2650                                                                                                                                                                                                                                                                                       | SHEET 6 OF 6 |
| APPROVED   |          | TITLE                                                                                                                                                                                                                                                                                       | SCALE        |
| DE APPR.   |          | 206/407 SKIDTUBE ASSEMBLIES                                                                                                                                                                                                                                                                 | NTS          |
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|                             |                                      |                                  |                                         |  |                                |                           |              |
|-----------------------------|--------------------------------------|----------------------------------|-----------------------------------------|--|--------------------------------|---------------------------|--------------|
| DRAWING NO.<br>D2650        | TITLE<br>206/407 SKIDTUBE ASSEMBLIES | REV. F                           | DART AEROSPACE LTD<br>ENGINEERING ORDER |  | D.E.O. NO.<br>D2650-F-1        | SHEET NO.<br>SHEET 1 OF 1 | SCALE<br>NTS |
| DRAWN<br><i>[Signature]</i> | CHECKED<br>A.P.                      | MFG. APPR.<br><i>[Signature]</i> | APPROVED<br><i>[Signature]</i>          |  | DE APPR.<br><i>[Signature]</i> |                           |              |
| DATE<br>12.10.12            | DATE<br>12.10.22                     | DATE<br>12.10.22                 | DATE<br>12.10.22                        |  | DATE<br>12.10.22               |                           |              |

**PURPOSE:**

CHANGE C'BORED WELDED CROSSBOLT SPACERS TO SWAGED SPACERS

**CHANGE:**

PARTS LIST IS AMENDED AS FOLLOWS:

IS:

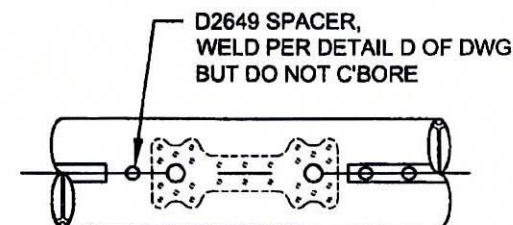
| QTY | QTY | QTY | QTY | PART NUMBER | DESCRIPTION       |
|-----|-----|-----|-----|-------------|-------------------|
| -1  | -3  | -5  | -7  |             |                   |
| 1   | 1   | 0   | 0   | D2649       | CROSS BOLT SPACER |
| 16  | 17  | 19  | 23  | D4720-1     | SPACER            |

WAS:

|    |    |    |    |       |                   |
|----|----|----|----|-------|-------------------|
| 17 | 18 | 19 | 23 | D2649 | CROSS BOLT SPACER |
|----|----|----|----|-------|-------------------|

ADD DETAIL G BELOW, WHICH IS THE SAME SECTION VIEW AS DETAIL D OF DWG.

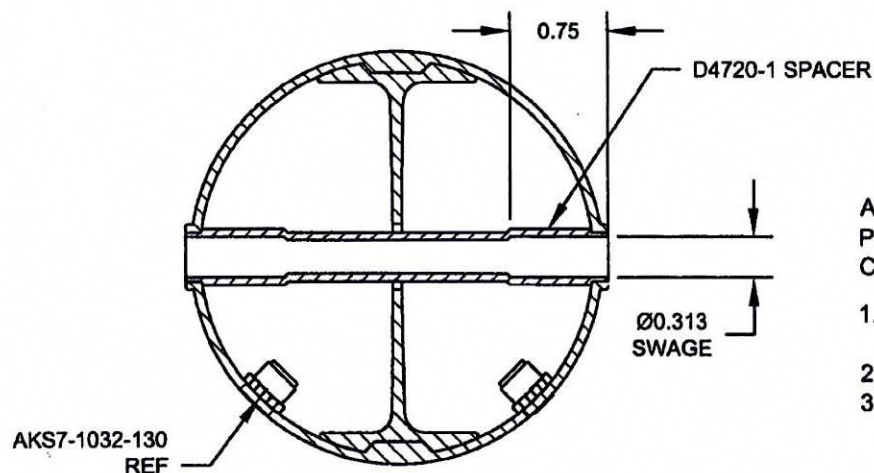
**C'BORED HOLES ARE NOW SWAGED PER DETAIL G BELOW. FOR THE Ø0.375 HOLE THAT IS NOT C'BORED, WELD PER DETAIL D OF DWG (SEE AMENDED DETAIL B FOR REFERENCE).**



**DETAIL B**

AMENDMENT TO DETAIL B  
NOT TO SCALE

**RELEASED**  
2012-11-16  
*[Signature]*



**DETAIL G**

FOR Ø0.375 HOLES ONLY

FOR HOLES THAT ARE CURRENTLY C'BORED ONLY  
NOT TO SCALE

AFTER DRILLING AND BENDING ASSEMBLY  
PERFORM THE FOLLOWING FOR Ø0.375 HOLES THAT ARE  
CURRENTLY C'BORED:

1. INSERT D4720-1 SPACER, 16 PL (-1) OR 17 PL (-3)  
OR 19 PL (-5) OR 23 PL (-7)
2. SWAGE TO Ø0.313 X 0.75 DP PER QSI 002
3. TRIM / GRIND FLUSH PER QSI 002



Dart Hawkesbury  
1270 Aberdeen St  
Hawkesbury, ON  
K6A 1K7  
Canada

Tel (613) 632-5200

## PURCHASE ORDER PO038152

**Supplier:** ATE003-VC  
Atelier Debosselage  
358 Principale  
Calumet  
QC  
J0V 1B0 Canada  
Phone: 819 242 5633

**PO No:** PO038152  
**PO Date:** 10/26/17  
**Due Date:** 10/27/17  
**Purchase Order  
Revision:**  
**Revision Date:**  
**Ship-To Contact:** Lavoie, Chantal  
Phone: clavoie@dartaero.com

**Ship To:** 1270 Aberdeen Street  
Hawkesbury  
ON  
K6A 1K7 Canada  
Phone: 613-632-5200

**Via:** Ground  
**Pymt Terms:** Net 30  
**Freight Terms:**  
**Special Comments:**

### Items

| Line<br>Item | Job    | Part                   | Rev | Description                      | Item Tax | Status | Due<br>Date | Order<br>Quantity | Received<br>Quantity | Balance | Unit<br>Price (CAD) | Extended<br>Price |
|--------------|--------|------------------------|-----|----------------------------------|----------|--------|-------------|-------------------|----------------------|---------|---------------------|-------------------|
| 1            | 166609 | D206-<br>642-<br>341BL | -   | prime and paint<br>delfleet blue |          | Firmed | 10/27/17    | 1 pcs             | 0 pcs                | 1 pcs   | \$225.00/pcs        | \$225.00          |
| 2            | 166598 | D206-<br>642-<br>341BL | -   |                                  |          | Firmed | 10/27/17    | 1 pcs             | 0 pcs                | 1 pcs   | \$225.00/pcs        | \$225.00          |
| 3            | 166601 | D206-<br>642-<br>341BL | -   |                                  |          | Firmed | 10/27/17    | 1 pcs             | 0 pcs                | 1 pcs   | \$225.00/pcs        | \$225.00          |
| 4            | 166607 | D206-<br>642-<br>341BL | -   |                                  |          | Firmed | 10/27/17    | 1 pcs             | 0 pcs                | 1 pcs   | \$225.00/pcs        | \$225.00          |
| 5            | 166596 | D206-<br>642-<br>341BL | -   |                                  |          | Firmed | 10/27/17    | 1 pcs             | 0 pcs                | 1 pcs   | \$225.00/pcs        | \$225.00          |
| 6            | 166588 | D206-<br>642-<br>341BL | -   |                                  |          | Firmed | 10/27/17    | 1 pcs             | 0 pcs                | 1 pcs   | \$225.00/pcs        | \$225.00          |
| 7            | 166590 | D206-<br>642-<br>341BL | -   |                                  |          | Firmed | 10/27/17    | 1 pcs             | 0 pcs                | 1 pcs   | \$225.00/pcs        | \$225.00          |
| 8            | 166604 | D206-<br>642-<br>341BL | -   |                                  |          | Firmed | 10/27/17    | 1 pcs             | 0 pcs                | 1 pcs   | \$225.00/pcs        | \$225.00          |

**Grand Total: \$1,800.00**

### Order Notes

DWG REV F(DEO) IPP Rev: H 05.10.11 Added D3429-1 per CHG004 KJ/CP/JLM IPP Rev: I 08-09-29 revF as per dwg DD verified by: EC  
Est Rev: J 09-03-02 as per DSI9440 rev.a DD verified by: EC IPP rev K 10.08.03 chg ms27039-1-08 for "C" type EC verf: DD IPP Rev: L  
12.11.22 now swage per ecn12-679 DD verf: JLM IPP Rev: M 14.04.25 ECN14-520 DD verf: JLM IPP REV: N 15.10.09 ADDED BL DD  
VERF: JLM IPP REV: O 16.01.22 PAR16-484 DD VERF: JLM

DWG REV F(DEO) IPP Rev: H 05.10.11 Added D3429-1 per CHG004 KJ/CP/JLM IPP Rev: I 08-09-29 revF as per dwg DD verified by: EC  
Est Rev: J 09-03-02 as per DSI9440 rev.a DD verified by: EC IPP rev K 10.08.03 chg ms27039-1-08 for "C" type EC verf: DD IPP Rev: L  
12.11.22 now swage per ecn12-679 DD verf: JLM IPP Rev: M 14.04.25 ECN14-520 DD verf: JLM IPP REV: N 15.10.09 ADDED BL DD  
VERF: JLM IPP REV: O 16.01.22 PAR16-484 DD VERF: JLM